

15
HUNYADI JÁNOS,
HUNGARIAN APERIENT WATER.



AN ACCOUNT
OF THE
HISTORY, CHEMICAL COMPOSITION, & CURATIVE PROPERTIES
OF
THE WATERS OF THE HUNYADI JÁNOS BITTER
SALZQUELLE, BUDA-PEST,
WITH OPINIONS OF EMINENT GERMAN AND ENGLISH
MEDICAL AUTHORITIES.

1846

This Water may be ordered of all Chemists and
Mineral Water Dealers.

CONTENTS.

	PAGE
HISTORY	5
SITUATION, GEOLOGICAL ORIGIN, AND PHYSICAL PROPERTIES . .	6
CHEMICAL COMPOSITION	9
PHYSIOLOGICAL ACTION	12
THERAPEUTIC APPLICATION	15
OPINIONS -	19

HUNYADI JÁNOS

NATURAL MINERAL WATER.



HISTORY.

THE mineral waters of Buda were known to the Romans; and they are mentioned in records with sufficient frequency to enable their history to be traced with tolerable accuracy down to the present day.

Under the name of Aquincum, Buda was the seat of a Roman legion, which was first stationed there either in the reign of Vespasian (69—79 A.D.) or in that of Trajan (98—117 A.D.). In the year 201 luxurious public baths, provided with fountains, had already been built. In the reign of the Emperor Philip (244—249) hot baths were erected; one of these was discovered in 1778, and during its examination a seal of the second Roman legion was found. In addition to the historical data, the name Aquincum indicates the high reputation which the Buda waters had then obtained.

In 451, Attila with the Huns invaded Pannonia, and, after overcoming the Romans, fixed the seat of his government on the Danube 'above the warm waters.' The Huns

were followed, in 568, by the Hunno-Avars; these, after retaining their independence for more than two hundred years, were totally subdued by Charlemagne (790—799), who, on their embracing Christianity, built the first church for them at Buda, 'near a spring.'

In 884, the Magyars, under their leader Almus, invaded Pannonia, and, having become masters of the country under Arpad, settled in the district of Buda, along the Danube, 'as far as the upper warm waters.' In 1211, the 'warm waters' are referred to in an order of King Andrew II., fixing the boundaries of an ecclesiastical district at Buda. In the reign of King Matthias Corvinus, the Buda waters enjoyed a high degree of popularity. The Turks, after their invasion of Hungary in 1541, added much to the comfort of the baths.

The Hunyadi János spring was accidentally discovered in 1863, during the digging of a well; and was soon afterwards sold, with the adjoining land, to Herr Andrew Saxlehner, of Pesth, who gave the spring its present name in honour of the celebrated Hungarian leader of the fifteenth century, Hunyadi János (John Hunyadi), the father of King Matthias Corvinus.

SITUATION, GEOLOGICAL ORIGIN, AND PHYSICAL PROPERTIES.

The City of Buda (German *Ofen*, oven or stove, from its hot springs) lies on the west bank of the Danube, which separates it from Pesth on the east, in latitude $47^{\circ} 29' N.$, longitude $19^{\circ} 3' E.$ The plain in which the Hunyadi János water is found is a portion of the great plain which, watered by the Danube, runs through Central Hungary, and in the neighbourhood of Buda is limited in extent by the mountains. The plain is separated by the mountains into three great divisions, each of which is of especial interest with regard to the Hungarian thermal and bitter waters. From

one of these divisions, which lies to the north, arise three powerful warm springs, capable of supplying 475,180 cubic feet of water in twenty-four hours. In the second division are the well-known thermal springs of Buda, of which the group rising in the Josephsberg (in the north) has a temperature of 27 to 61 cent. ($80\cdot6^{\circ}$ to $148\cdot8^{\circ}$ Fahr.), and furnishes in twenty-four hours 1,547,411 cubic feet of thermal water; while the Blocksberg group (on the south) has a temperature of 38 to 45 cent. ($100\cdot4^{\circ}$ to 113° Fahr.), and supplies 112,096 cubic feet in twenty-four hours. The third and most southerly division is that in which the Hunyadi János springs lie; it is bounded by the Blocksberg, Adlersberg, Galgenberg, Petersberg, and Lerchenberg.

From a geological examination of this plan by Professor von Szabó, it appears that the chemical formation of the Buda bitter-waters takes place at only a small depth below the surface of the earth; and thus is explained the remarkable regularity of their continuous and abundant supply. The geological structure of the soil is: (1) Soil and loam; (2) Sand and gravel; (3) A thick layer of clay (at least 144 feet). The upper part of the first of these strata is sufficiently loose to collect the rain-water, while the density of the lower portion prevents communication between the ground-water and the second stratum. The second stratum, of sand and gravel, is that which contains the bitter waters. Hydrostatically, the three strata form an interesting combination; a stratum pervious to water lies between two impervious strata, each of which forms an independent reservoir. Hence it results that the rainfall cannot in general exercise any direct influence on the chemical composition of the bitter salt spring; a slight influence only is exercised at the border of the mountain range, where the stratum of gravel commences.

In regard to temperature, the Hunyadi János spring belongs to the heterothermal class. The average yearly temperature is 10·9 cent. ($56\cdot62^{\circ}$ Fahr.); the average monthly temperatures are:—

January . . .	9 Cent. = 48·2 Fahr.
February . . .	8 „ = 46·4 „
March . . .	7 „ = 44·6 „
April . . .	8 „ = 46·4 „
May . . .	9 „ = 48·2 „
June . . .	10 „ = 50·0 „
July . . .	11 „ = 51·8 „
August . . .	13 „ = 53·6 „
September . . .	13 „ = 55·4 „
October . . .	12 „ = 53·6 „
November. . .	11 „ = 51·8 „
December. . .	10 „ = 50·0 „

The average temperature of the superficial sweet-water springs is 9 cent., or nearly two degrees centigrade (3·42° Fahr.) lower than that of the bitter waters. This difference is explained by Herr Johann Molnár, a well-known analytical chemist of Pesth, by the chemical processes which take place in the formation of the bitter water. The lowest stratum in which the formation of the Buda bitter-water commences consists chiefly of sandy dolomite, which is very favourable to chemical action. The surface-water (*Tagwasser*), containing carbonic acid, penetrates into the pores of the dolomite, and dissolves out the carbonate of lime and the magnesia as bicarbonates. Charged with these, the water passes into the stratum of marl lying on the thick clay, and comes into direct contact with the latter. Both marl and clay contain a large quantity of pyrites, which is acted on by atmospheric oxygen and by the water, hydrated oxide of iron and sulphuric acid being formed. The former remains deposited; the sulphuric acid, on the other hand, acts on the carbonates of lime and magnesia, converting them into sulphates. The sulphate of lime, being very sparingly soluble, is deposited in crystals near the place of its formation, while the readily soluble sulphate of magnesia, with some sulphate of lime, is taken up by the water. The water thus charged reaches the stratum of gravel, through which it spreads without resistance, and a portion of the sulphuric acid of the bitter

water combines with the soda contained in the stratum. These chemical decompositions and combinations appear to afford the explanation of the fact that the bitter water is so much warmer than the surface-water, although the latter is warmed by the rays of the sun.

As the bitter water lies at no great depth (not more than 15 to 20 feet), it will be readily perceived that its temperature is affected partly by the season of the year, partly by the surface-water. In winter the upper layers become gradually, but only to a small extent, diluted with the surface-water, and are slightly cooled thereby; hence the lowest layers of the bitter water must be more concentrated and warmer than the upper.

CHEMICAL COMPOSITION.

The water of the first-discovered Hunyadi János spring was analysed in 1863 by Herr Molnár, of Pesth, who found a pound (7,680 grains) to contain 299·6008 grains of solid matter; in which were 137·9888 grains of sulphate of magnesia, and 128·9779 grains of sulphate of soda.

After the discovery of the original Hunyadi János spring, a second was opened, and its water used in commerce for the same purpose. A comparative analysis of the two springs showed the latter to be richer in sulphates. Subsequently four other springs were opened; and the Hunyadi János water now exported by the proprietor, Herr Saxlehner, is a combination of six bitter waters obtained from the same locality, and nearly similar in composition. The water, which is collected in wells lined with blocks of sandstone and carefully covered, is perfectly clear, inodorous and colourless, of a refreshing bitter taste, and without any, saline after-taste.

Chemical analyses of the Hunyadi János bitter-water were made in October, 1869, by Dr. Edward Schwarz, private teacher of Analytical Chemistry in the University

of Vienna; in May, 1870, by Herr G. L. Ulex, sworn official chemist in Hamburg; and in the summer of the same year by Herr Knapp, under the direction of Baron Justus von Liebig, President of the Bavarian Academy of Science.

The analyses thus made by four independent chemists in different years showed that, in spite of various meteorological influences, the Hunyadi János waters underwent no important change, and that the amount of solid constituents varied by only about nine-tenths per cent.

Among the constituents of the Hunyadi János water, it is the sulphate of soda and sulphate of magnesia that demand special attention, as it is on them principally that the therapeutic action of this water, as of other bitter waters, depends. It is not the mere fact of containing these salts, but its richness in them to an extent hitherto unknown in balneology, that has gained for the Hunyadi János water a reputation beyond all other bitter waters used for therapeutic purposes. This richness of the water in these salts is shown by the analyses mentioned below, and especially by the following one of Professor Bunsen.

An analysis by Professor Bunsen, of Heidelberg, gives the following quantities in 10,000 parts of the water:—

Sulphate of Soda	225.514
Sulphate of Magnesia	223.500
Bicarbonate of Soda	6.760
Bicarbonate of Strontian.	0.270
Bicarbonate of Oxide of Iron.	0.006
Bicarbonate of Lime	7.967
Sulphate of Potash.	1.206
Chloride of Sodium	17.048
Silicious Earth	0.106
Free and semi-combined Carbonic Acid	5.226

The superiority of the water over those of the best-known and most-used bitter waters, such as Püllna, Said-schütz, Seidlitz, Kissingen, and Friedrichshall, is also shown in the following comparative analysis by Dr. E. Schwarz, of

Vienna. The quantities represent the proportions in a pound (7,680 grains) of the water:—

CHEMICAL INGREDIENTS	Hunyadi	Friedrichshall	Kissingen	Seidschütz	Püllna	Seidlitz
	Vienna Grains					
Sulphate of Magnesia .	137·98	39·55	39·50	84·16	93·08	104·00
Sulphate of Soda .	128·97	46·51	46·59	46·80	123·80	—
Sulphate of Potash .	1·67	1·52	—	4·09	4·80	—
Chloride of Sodium .	11·54	61·10	61·10	—	—	—
Carbonate of Soda .	13·20	—	—	—	—	—
Carbonate of Lime .	6·04	0·11	—	—	0·77	8·00
Oxide of Iron and } Argillaceous Earth }	0·08	latent	—	1·19	—	—
Silicic Acid .	0·09	„	—	0·03	0·17	—
Carbonate of Magnesia	—	3·99	—	4·98	6·40	3·00
Sulphate of Lime .	—	10·34	—	10·07	2·60	8·00
Chloride of Magnesium	—	30·25	30·20	2·16	19·66	3·00
Nitrate of Magnesia .	—	—	—	25·17	—	—
Bromate of Magnesia .	—	0·87	latent	—	—	—
Chloride of Lithium .	—	—	0·09	—	—	—
Carbonic Acid, free and half combined .	299·57 8·02	194·24 5·32	177·48 5·09	178·65 latent	251·28 latent	126·00 —

This comparative analysis, which agrees in the main points with one made by Dr. Molnár, of Pesth, justifies the verdict of Baron von Liebig, that ‘the amount of Epsom salt and Glauber’s salt in the Hunyadi János water exceeds that of all other known bitter springs; and it is not to be doubted that its activity is in the same proportion.’ Ulex also, in publishing his analysis of the Hunyadi János water, remarked that ‘this mineral water contains more salts than the Friedrichshall bitter-water, which Justus von Liebig has called a “treasure of nature.”’

The carbonate and chloride of sodium, as well as the free and semi-combined carbonic acid, no doubt have an important effect in increasing the action of the water. Regarding the small proportion of chloride of sodium, Dr. Schwarz remarks: ‘Besides its unsurpassed richness in its active constituents, the Hunyadi János water is more easily taken than other bitter waters in consequence of the smaller proportion of common salt which it contains, as may at

once be discovered by any palate which tastes it.' This greater tolerance is also increased to no unimportant extent by the amount of free carbonic acid.

PHYSIOLOGICAL ACTION.

In the consideration of the physiological action of the Hunyadi János waters, the sulphates of soda and of magnesia have the first place. The researches of Dr. Sick and Dr. Seegen have shown that small quantities of sulphate of soda are more or less completely absorbed from the stomach and intestines, and exercise an important action in their course through the blood. From Seegen's experiments on animals, it appears that during the action of sulphate of soda (with which that of sulphate of magnesia perfectly agrees) the process of oxidation in the organism is directed more to the fats or carbo-hydrates, the nitrogenous elements of the body being acted on to a less extent. Under the continued use of Glauber's salt (sulphate of soda), animals lose their padding of fat, but without becoming thinner or losing weight. A portion of the Glauber's salt absorbed from the intestinal canal passes into the milk.

When greater quantities of sulphate of soda are taken the above-mentioned action is produced, especially if the intervals between the doses be not too short; but when large doses of Glauber's salt are given, the greater part of the salt is generally soon carried out of the body by the action of the bowels which it produces, and which, if it recur frequently for some time, reduces the absorption of nutritious materials from the alimentary canal, and also accelerates the tissue-waste in both directions, so as to give rise to loss of bulk as well as of weight of the body.

A varying proportion of the salt remaining in the intestinal canal appears to be deoxidised by the action of the organic matters, and to be converted into sulphide of sodium; for, after the administration of Glauber's salt, there is a development of sulphide of hydrogen in the intestinal canal, and possibly, also, a formation of some sulphide of iron.

With regard to the watery evacuations following the administration of large doses of sulphate of soda and sulphate of magnesia, there is a difference of opinion as to whether they are produced by transudation from the intestinal capillaries or by increased peristaltic action of the intestine. According to Dr. Thiry and Dr. Radziejewski, the discharge which follows the internal administration not only of sulphate of soda but of other aperients is produced solely by increased peristaltic action. When large doses of sulphate of soda are introduced into the stomach, they induce by reflex action an increased peristaltic movement of the whole intestines, and entirely arrest the digestion of the contents of the canal. The evacuations thus produced consist, then, simply of the contents of the bowels, and are not, as has been almost universally assumed, the result of transudation. Even such powerful medicines as gamboge, croton-oil, senna, &c. act only by accelerating peristaltic action, and thus preventing absorption of the contents of the intestine.

The small amount of chloride of sodium in the Buda bitter-water, as well as the free and semi-combined carbonic acid, must on theoretical grounds increase the physiological action of the sulphates. The assumption holds good, generally, that the introduction of carbonic acid into the stomach stimulates the activity of the digestive canal, augments its peristaltic movements, increases the appetite, &c. ; while the action of small doses of chloride of sodium agrees with that of small doses of Glauber's salts.

The action of the Hunyadi János bitter-water may be thus summarised. In small quantities—about a whole or half wine-glassful daily before bedtime—it slowly stimulates the activity of the gastro-intestinal canal, increases the quantity of water in the intestine, and the next morning produces, without pain, one or two pulpy evacuations of a darker colour than usual. The renal excretion is not increased by the use of the water, but is rather slightly diminished. The appetite is increased, and is not lost even when the drinking

of the water is continued for therapeutic purposes for some time. The weight of the body is not reduced, for the elimination of nitrogen from the organism appears to be essentially limited ; while during the use of the water the process of oxidation is more directed to the fatty constituents of the body. When taken in larger quantities—one or two wine-glassfuls or more in the morning, fasting—it induces, by reflex action on the stomach, greatly increased peristaltic action of the intestinal canal, augments the quantity of water in the intestinal contents, and more or less quickly produces, with little or no pain in the abdomen, and with evident relief, from four to six evacuations—at first pulpy, afterwards watery. In consequence of this increased peristaltic action of the intestine, the elimination of the more or less completely digested food and of the intestinal secretions is quickened, less fluid is supplied to the tissues of the organism through the interference with absorption, the tissue-change is stimulated, the elimination of nitrogenous elements as well as of carbo-hydrates is increased, and, under the prolonged use of the water, loss of weight is produced. It is only a too abundant or too prolonged use of the water that can injure digestion and the general health. Dr. Seegen, in his ‘Handbook of General and Special Balneology,’ says :—‘The deeply penetrating action on the change of tissue, which we have ascertained from our experiments with sulphate of soda, is beyond doubt essentially connected with the therapeutic indications for Glauber’s salt water. In many diseases in which we see these waters to be of use, there is a disposition to an excessive collection of fat, either in the whole body or in individual organs, such as the liver. By the use of small doses of Glauber’s salt, the decomposition of the nitrogenous tissues is limited; and we have endeavoured to explain this by the more active oxidation of the carbo-hydrates. The remarkably rapid reduction of the abnormal collections of fat produced by Glauber’s salt water gives additional support to our view, and we gain thereby a closer insight into the hitherto almost unexplained action of the Glauber’s salt water.”

THERAPEUTIC APPLICATION.

The use of the Hunyadi János water (which in the course of a few years has attained an extraordinary popularity, the amount exported having risen, according to the proprietor, Herr Saxlehner, from 40,785 bottles in 1863, to 1,300,000 bottles in 1874) is indicated for the following purposes:—

I. *As a mild aperient, not interfering with digestion, in habitual constipation and its resultant evils.*—The numerous symptoms of abdominal congestion which are frequently produced, or at least maintained, by constipation, and the after-effects on individual organs—such as the liver, spleen, stomach, intestines, &c.—are found by experience to be not unfrequently remarkably improved when the constipation is removed. For this purpose, and as a mild aperient, the Hunyadi János water is found very useful when taken in small doses for some time, and is to be recommended especially in the following conditions, among others:—

1. In habitual congestion—from whatever cause arising—of the brain, lungs, &c., especially in so-called full-blooded individuals.

2. In the treatment of various mental diseases, especially those which set in with constipation, and in which resolvent or evacuant remedies are especially indicated. In his 'Textbook of Pharmacology,' Professor von Schroff says:—'I have convinced myself of the extensive utility of bitter waters in the treatment of mental diseases during my practice in the Asylum at Prague, where I introduced the use of the remedy in 1828.' Other physicians of lunatic asylums (such as Damerow, Erlenmeyer, Harnisch, von Solbrig, &c.) speak highly of the action of bitter waters in general, and of the Buda water in particular, in the treatment of mental diseases.

3. In the disposition to meningeal and cerebral hæmorrhages, and in the functional disturbances, especially paralysis remaining after apoplexy.

4. In all chronic diseases of the brain, spinal cord, and nerves which are accompanied by habitual constipation.

5. In all diseases of the eye, in which either a temporary discharge from the intestinal canal, or a longer-continued one, may be brought into use with advantage.

6. In chronic diseased conditions of the organs of respiration and circulation, attended with disposition to hyperæmia and hæmorrhage. Here the Hunyadi János water affords quite exceptional service against the irritability of the heart, which is observed in young persons of both sexes at the time of puberty, and which manifests itself by headache, epistaxis, troublesome palpitation, dry paroxysmal cough, feeling of distress, oppression at the epigastrium, constipation, &c. : also in cardiac hypertrophy, and in the conditions connected with disease of the valves (in which Dr. von Bamberger speaks specially of the beneficial action of bitter water); and in cases of acute and chronic bronchial catarrh, pleuritic exudation, &c.

7. In acute or chronic gastro-intestinal catarrh and gastric disturbance, whether arising from error in diet, or from the inordinate use of articles of food or drink, and produced and maintained by the habitual use of large quantities of beer, or by other causes.

8. In many diseases of the liver in which the object is to favour the secretion and excretion of bile, and to remove hyperæmia and inflammatory conditions of this organ, and the concomitant nervous disturbances, &c.

9. For the purpose of reproducing intermittent fever when suppressed too soon. For this purpose, according to Dr. Amelung, small doses of Glauber's salt are very efficacious; and this view is supported by Professor von Schroff. The large sale of the Hunyadi bitter-water in the fever districts shows its excellent action in the sequence of intermittent fever, especially gastric catarrh and enlargement of the spleen and liver.

10. In chronic diseases, symptomatic of affections of the abdominal and thoracic organs; in serous effusions, which produce impediment of respiration and circulation, saline

evacuants, as is well known, produce remarkable relief of suffering.

11. In collections of fat, either in the whole body, or in individual parts or organs, as the liver. Dr. Seegen ascribes to Glauber's salt water quite a specific action in these anomalies of nutrition.

12. In dilatation of the veins of the rectum following so-called abdominal plethora, congestive affections, &c. In these cases the causes as well as the results of the dilatation may be overcome by the promotion of regular soft evacuations.

13. In some chronic diseases peculiar to females, Scanzoni speaks highly of the use of the Hunyadi János water.

14. In the numerous, sometimes troublesome, sometimes important, conditions which affect many women at the 'change of life.'

15. In the congestive conditions and constipation of pregnant women, and of those suffering from ovarian or uterine tumours.

16. To reduce the secretions of milk in women who cannot nurse, or in whom lactation must be suddenly arrested.

17. In chronic skin-eruption, following pelvic congestion, especially on the face, lower limbs, &c.

18. In many cases of gout and rheumatism.

19. As an aperient during the continued use of opium and morphia, especially during subcutaneous injections of the latter.

20. Against habitual costiveness in infants. It is found by experience that the active ingredients of the Hunyadi János bitter-water, especially the sulphate of soda, pass into the nurse's milk.

21. As a preparation for, or sequel of, a course of treatment at Marienbad or Karlsbad. In such cases the use of Marienbad and Karlsbad salts is often rightly recommended; but, from their much higher price and their frequent adulteration, the Hunyadi János water is an excellent substitute.

In the above-named conditions the Hunyadi János water is given in medium and small doses (from a tablespoonful to a tablespoonful and a half, rarely a wineglassful), once or twice daily, or on alternate days, according to the disease and the individual. It is generally given at bedtime or in the morning before meals, more rarely once in the course of the day; it should not be too cold, but should have a temperature of 10 to 15 deg. Reaumur (48° to 50° Fahr.). It is sometimes used for a fixed period (three, four, or five weeks), the diet being specially regulated, and the quantity of the water gradually increased from the beginning, and decreased towards the end; or less systematically, during an undetermined period, and without any change of diet or mode of living.

There is probably no other bitter-water which can be so pleasantly used in the conditions above mentioned at any time of the year, even in winter, and which produces such favourable results, as the Hunyadi János water. The nature of each individual case must show whether the patient should undergo a regular or a less systematic course of treatment with the Hunyadi János bitter-water. The use of the water may, as has been already stated, be continued for some time without the least injury.

II. *As a laxative in all diseases which require the use of a mild so-called antiphlogistic evacuant, tolerably rapid and yet safe in its action*; as in threatenad cerebral or pulmonary hæmorrhage, in pulmonary œdema, its commencing inflammation of the meninges, in inflammations (except those of the bowels and kidneys), in gastric and intestinal catarrh commencing with constipation, &c., especially in strong and full-blooded persons. In the above-named diseases—mostly acute—the Buda bitter-water must be given in larger doses (a wine-glass or tumblerful in the morning, before meals, and, if necessary, repeated once in the course of the day). In these doses, its administration produces several actions of the bowels, without being followed by congestion of the gastro-intestinal canal, or, as a rule, by colicky pains.

III. *As a remedy in cases of poisoning with soluble inorganic salts*, such as those of baryta, lead, &c. In these cases, Orfila, as is well known, recommended sulphates, and especially the sulphate of magnesia. The Hunyadi János bitter-water acts here not only as an aperient, but also as a chemical agent; the sulphate of magnesia gives up its sulphuric acid to the metallic oxide present in the organism, forming with it an insoluble salt.

OPINIONS.

THE following opinions, in addition to those already mentioned, have been expressed by eminent authorities as to the unique efficacy of the Hunyadi János mineral waters:—

From the late BARON VON LIEBIG, *Chairman of the Royal Bavarian Academy of Sciences.*

The Hunyadi János water contains more aperient salts than any other known, and it cannot be doubted that its efficacy is in proportion thereto.

(Signed) J. VON LIEBIG.

Munich, July 19th, 1870.

Professor Dr. VIRCHOW, *Director of the Pathological Institute, Berlin, says:—*

I have tried the Hunyadi János bitter-waters which you have sent me on a large number of persons, with invariably good and prompt success. I consider this water to be a most valuable item in our Balneological treasury of remedies, and with great pleasure bear testimony of this.

R. VIRCHOW.

Berlin, February 8th, 1875.

Professor Dr. VON BAMBERGER, *Director of the Medical Klinik in the University of Vienna*, writes :—

I herewith certify that I have prescribed the Hunyadi János waters with remarkable success in all those diseases for which bitter waters are used.

Professor Dr. VON BAMBERGER.

Professor Dr. SCANZONI (VON LICHTENFELS), *Professor of Medicine in the University of Würzburg*, writes :—

After having made a large number of experiments, extending over many years, I have been so much impressed with the excellent results of the Hunyadi János water, that in all cases where the use of bitter water is desirable, I prescribe none but this, and am convinced that its value will meet with increasing recognition in the hands of other medical men.

Professor Dr. SCANZONI (VON LICHTENFELS).

Professor Dr. FRIEDREICH, *of Heidelberg*, writes :—

I testify with pleasure that, after long experience of the merits of the Hunyadi János spring, I am firmly convinced that these waters show the most excellent results in many diseases, principally those of the bowels ; and that they leave nothing to desire as regards certainty and mildness of action.

Professor Dr. FRIEDREICH.

Heidelberg, August 21st, 1874.

Dr. VON BUHL, *Professor of Medicine in the University of Munich*, says :—

Among all known bitter waters the Hunyadi János water indisputably occupies the first position. It acts with promptitude and certainty, without inconvenience, and on an average the dose required is only half that of other bitter waters.

Professor P. SPIEGELBERG, *Director of the Obstetric Clinic in the University of Breslau*, writes :—

I willingly testify that during an extensive use of bitter waters in my practice, I have found none so prompt and at the same time

mild in action, and so little productive of after-disturbance, as the Hunyadi János water. None can be so well borne for a length of time. Since I have become acquainted with it I have prescribed no other.

Professor Dr. VON NUSSBAUM, *of Munich, General Staff Surgeon in the Royal Bavarian Army, says:—*

In most cases I prefer the Hunyadi János water to all other bitter waters, as being most pleasant to the patients, and producing the desired result even with very small doses.

Dr. VON GÄRTNER, *Superintendent of the Surgical Department of the Catharine Hospital in Stuttgart, says:—*

The Hunyadi János bitter-water, specially rich in soluble salts, has, in the hands of the undersigned, proved superior to all other bitter waters by its very certain and painless action even in small doses. Its remarkably soft and mild taste also recommends it.

Dr. VON GÄRTNER.

Dr. HERMANN WEBER, *Physician to the German Hospital in London, in his translation of Dr. BRAUN'S work on 'The Curative Effects of Baths and Waters,' writes, on page 359, as follows:—*

The Hunyadi János waters are, in fact, the richest bitter waters as known. Sixteen ounces contain 300 grains of solid substance, including 138 of Epsom salts, and 129 of Glauber's salt, with 11 of chloride of sodium, and 13 of carbonate of soda, while most other bitter waters do not contain any carbonate of soda. We have found these waters very useful where simple saline aperients were required.

Dr. JOHN MACPHERSON, *Inspector-General of Hospitals, author of 'The Baths and Wells of Europe,' writes as follows, in the 'London Medical Record' of March 15:—*

There is a class of mineral waters which are rarely drunk at the places where they rise, but which are largely exported. They are called by the Germans 'bitter waters,' on account of the taste which they have of Epsom salts. In England we have waters of this class, for instance, at Streatham, but they are not strong

enough. These waters are all aperient, and their value has long been acknowledged. Thus the true Seidlitz water (what passes under the name of 'Seidlitz powder' bears no resemblance to it) was long known in England as a fairly convenient aperient; but its chief ingredients, about 13·54 parts of sulphate of magnesia in 1,000 parts, were not sufficient to make it quite powerful enough. Two other waters of the same class, the Friedrichshall and Püllna, were imported from Germany some years ago, and have been much used in England, being superior to the Seidlitz water; and recently a Hungarian water, called the Hunyadi János, has been introduced, which bids fair to be the most popular of all. The chief contents of these three waters will be at once seen by a glance at this table, which shows the relative amount of their salts in 1,000 parts:—

	Friedrichshall.	Püllna.	Hunyadi.
Sulphate of Magnesia . .	5·1	12·12	16·0
„ Soda . .	6·0	16·11	15·9
Chloride of Sodium . .	7·9	—	1·3
„ Magnesium . .	3·4	—	—
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Total, including all constituents . . }	25·19	32·7	35
Relative proportion of Carbonic Acid free and half combined . . }	166·3	69	278·5

It is obvious that Püllna and Hunyadi are the two richest in sulphated salts, while Friedrichshall contains a considerable amount of chlorides. None of these waters contain much carbonic acid, though the Hunyadi has most, and has the advantage of containing a minute portion of carbonate of soda, amounting nearly to 1 part in the 1,000.

Of these waters the Püllna and Hunyadi are, as might be conjectured, the most active aperients.

Aperient waters of this class are used in two ways: first, as ordinary purgatives, like a dose of medicine, when they are given in full single doses; secondly, to correct the habit of constipation, when they are given in small doses for a considerable period.

For the first purpose, on an average about half as much is required of the Hunyadi as of the Friedrichshall, and very distinctly less than of the Püllna. The water of the Hunyadi is mild, and of a comparatively pleasant taste, acts rapidly, and usually without almost any griping. It produces first soft and then copious watery motions. It increases the secretion of bile, but is not known to alter its quality. It diminishes the amount of urea and of water, and less nitrogen is excreted from the system.

For the second purpose, that is, for overcoming habitual constipation, the Friedrichshall has been the favourite in Germany. It is generally thought the least lowering, but is bulky, and not very certain in its operation. Püllna in smaller doses answers extremely well, and although its continued use is described as lowering, I have never seen any harm from its use extended over long periods. Hunyadi water may be used in the same way, and there is no doubt of its efficacy, although there is not as complete evidence of its action in these small continued as in its larger doses.

It is only thirteen years since the Hunyadi water was discovered. There are six springs close to each other near Buda, with water of almost identical composition, and these waters are mixed together to form the water which goes by the name of Hunyadi János. Its constituents do not vary in amount, as those of the Püllna are said to do.

All the first physicians of Germany have made extensive trials of the Hunyadi, and have declared that it is the most certain and the most comfortable in its action of all the aperient waters. The special indications for its use are, in costiveness (especially in that of pregnancy), in portal congestion with tendency to hemorrhoids, and in sluggish action of the liver.

A half or a full wine-glassful of the Hunyadi water taken at bedtime produces a couple of soft motions next morning. One or two wine-glassfuls, taken in the morning fasting, produce four or five motions—at first soft, afterwards watery. It is most efficacious when taken at a temperature not below 60°.

It is very evident that this convenient and sure purgative, of whose action it is so easy to limit the extent, is a very valuable addition to our remedies ; such a medicine may come into play in the treatment of almost any affection. It is not surprising to learn how extended its use is in Southern Germany, and that its employment is rapidly spreading in England.

APPROBATION DE L'ACADEMIE DE MÉDECINE DE PARIS,
lue dans la séance du 17 Décembre, 1872.

Cette eau, analysée par des chimistes étrangers, est très-chargée en principes minéralisateurs : elle contient une très-forte proportion de chlorures et de sulfates. D'après le Baron de Liebig la quantité de sulfate de magnésie et de soude contenue dans l'eau

Hunyadi János surpasse de beaucoup celle que l'on trouve dans les sources connues. L'eau, examinée au laboratoire de l'Académie, laisse par litre 43 grammes de résidu. Ce résidu renferme des proportions de chlore, d'acide sulfurique, de magnésie, et de soude conformes aux analyses citées.

OPINION OF THE MEDICAL STAFF OF THE GERMAN HOSPITAL AT
DALSTON.

The Hunyadi János mineral water has, generally, a more rapid and powerful effect than the Püllna water, so that a quarter of a pint was in most cases sufficient to produce a desired effect, while we had to use half a pint of Püllna water for the same purposes.

This result is not surprising, if we take into account the large quantity of sulphate of magnesia and sulphate of soda contained in the Hungarian spring.

The water is certainly to be recommended.

March, 1873.

The *British Medical Journal* of March 4, 1876, says :—

The Hunyadi János mineral water is an aperient water from springs at Buda, of which the most eminent German authorities speak in very high terms, and which appears to be rising in popularity in this country. The following are the latest analyses :—In 10,000 parts were found 223.500 sulphate of magnesia, 1.206 sulphate of potash, 225.514 sulphate of soda, 17.048 chloride of soda, 6.760 carbonate of soda, 7.967 carbonate of lime, 0.106 silicic acid, 0.006 oxide of iron, &c., 5.226 carbonic acid, free and half combined. Baron Liebig speaks of it as the richest water in aperient salts. Professor Virchow states that he has tried these waters on a large number of persons, with invariably good and prompt success. Spiegelberg, Friedreich, and Scanzoni, who have all used this water very extensively, speak of it as excelling all others in the evenness and mildness of its effects. Since it has been brought under our notice, we have employed it with good effect as a saline aperient. It seems to deserve the high popularity which it enjoys among eminent German authorities, and appears to us to be the most agreeable, safe, and efficacious aperient water which has been brought under our notice. Aperient

medicines generally are nauseous, and the absence of disagreeable flavour in this water, together with the very light doses in which it is efficacious (less than half that of other more disagreeable waters), makes it worth the notice of the profession, and is likely to ensure its general popularity.

The *Lancet* says :—

‘Baron Liebig affirms that its richness in aperient salts surpasses that of all other known waters.’

OPINION OF DR. RAWDON MACNAMARA, *Professor of Materia Medica in the Royal College of Surgeons in Ireland; Editor of the 7th Edition of NELIGAN'S ‘Medicines, their Uses or Mode of Administration,’ &c.*

I have submitted the Hunyadi János aperient water to a very careful clinical investigation, and have been most agreeably surprised with the result.

It is far more palatable than any other aperient mineral water hitherto introduced to public notice, and the rapidity with which it acts, producing no uneasiness or distress whatsoever, is really remarkable.

Comparison between the published analyses of the Hunyadi János, Püllna, and Friedrichshall waters, proves the Hunyadi János water to be the richest in the sulphate of magnesia and of soda—a very remarkable fact when its far more agreeable taste is taken into consideration, but one fully accounting for its superiority as a remedial agent. In my opinion, there can be no question of the Hunyadi János being by far the most valuable of our aperient mineral waters.

OPINION OF PROFESSOR AITKEN, F.R.S., *Professor of Pathology, Army Medical School; Author of ‘The Science and Practice of Medicine.’*

I find that from one to two ounces, with about an equal quantity of warm water, is a sufficient dose as an aperient; and I also find that those who have used Püllna and Friedrichshall

prefer the Hunyadi János water to either, because the bulk of the dose is less than either of those waters ; and the action is less drastic, producing no distress or uneasiness. It is, moreover, less unpleasant to taste than any other aperient mineral water that I know of. I consider the Hunyadi János water a most valuable addition to this class of remedial agents.

OPINION OF DR. T. LAUDER BRUNTON, F.R.S., *Lecturer on Materia Medica at St. Bartholomew's Hospital; Examiner in Materia Medica in the University of London.*

It is now many months since I first received a circular regarding the Hunyadi János water ; but I threw it aside, and gave no further heed to the matter until, during a recent visit to Vienna, I heard a mineral water, termed 'Ofner water,' more frequently prescribed than any other by physicians in the General Hospital of that city. The preference given to it was due, as I was told, to its taste being more pleasant than that of its rivals, while its efficacy as a purgative equalled or surpassed theirs.

My curiosity was excited, and I made further enquiries, from which I learned that this favourite Ofner water and my old acquaintance Hunyadi János were one and the same—the term Ofner being derived from Ofen, the German name of Buda, near which the source is situated.

The analysis of the water by Baron Liebig shows that it contains an unusual proportion of sodium and magnesium sulphates, and experience has shown me that its efficacy as a purgative corresponds to the expectations raised by its unusual chemical composition.

OPINION OF DR. F. T. ROBERTS, *Assistant-Physician, University College Hospital; Author of 'A Handbook of the Theory and Practice of Medicine.'*

The clinical inquiry which I have conducted with reference to the action of the Hunyadi János water has convinced me that it constitutes a most valuable addition to the list of aperient mineral waters at present in use. It produces its effects speedily and surely,

without causing the slightest discomfort, and the gentle action which it excites seems to be kept up for some days.

I have found this water highly efficacious, not only as an ordinary aperient, but also in cases of obstinate habitual constipation.

One great recommendation is, that the taste of the Hunyadi János water is much pleasanter than that of the other waters of this class, and it does not leave any disagreeable flavour behind.

My firm opinion is, that when the merits of this water are more widely known, it will be largely employed in this country.

OPINION of Dr. A. SILVER, *Physician and Lecturer on Clinical Medicine and Physiology in Charing Cross Hospital.*

I have made use of the Hunyadi János mineral water ever since its introduction into this country, and with ever-increasing satisfaction.

I look upon the introduction of this water, as compared with other similar waters, as an advance almost as great as the use of these was an improvement on the employment of Glauber's or Epsom salts in their simple form.

A very small quantity of the Hunyadi János water suffices to secure an efficient action of the bowels. This is best taken in the morning, fasting, and shortly followed by a cup of tea or coffee swallowed quite hot. Neither sickness nor griping follows. Its use in this way will be found highly beneficial by many, who, though they may be described as being in good health, yet from a sedentary occupation, or other causes, are liable from time to time to what are called bilious attacks.

OPINION of Dr. BURNEY YEO, *Senior Assistant-Physician to King's College Hospital and to the Brompton Hospital for Diseases of the Chest; Author of 'Therapeutic Progress in Relation to Therapeutic Methods.'*

44 HERTFORD STREET, MAYFAIR, W.,
9th March, 1876.

I have for some time been acquainted with the valuable properties of the Hunyadi János mineral water, and my experience

quite confirms the favourable opinions expressed of it by Professors Virchow and Bamberger.

It is an efficient and agreeable laxative. It is much richer in the saline aperient sulphates than the other bitter aperient waters in general use ; and as it contains less chlorides, it is more applicable to those cases in which the chlorides prove irritating to the digestive organs.

It has the additional advantage of being efficient in smaller quantities.

(Signed)

I. BURNEY YEO, M.D.